

# International Prevention and Management of Invasive Species: The Never-Ending Challenge

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# Invasive Alien Species Issues Are Cross-Sectoral with Multiple Linkages

- Sustainable biodiversity,
- Global warming,
- T&E Species preservation,
- Living modified organisms,
- Global plant, animal and human health
- Invasive species issues are addressed in all of these policy discussions--this talk represents just a few of the fora where actions addressing IAS are ongoing



# **International Activities on a Multi-Lateral Scale**

- Multilateral agreements and treaties are useful when IAS impacts affect resources shared by the international community.
- Examples: CBD, IPPC, Ramsar Convention on Wetlands, International Maritime Organization (IMO), the World Organization for Animal Health (OIE), Food and Agriculture Organization (FAO) and World Health Organization (WHO).

# *Convention on Biological Diversity*

- Article 8(h) commits Parties to the Convention to:  
*“prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species.”*
- The recognition of IAS by the Convention as a primary reason for loss of biodiversity was a critical step in generating international recognition of the link between managing IAS and sustaining biodiversity.
- 3 Decisions: IV/I; V/8; VI/23\*

# *CBD--SBSTTA*

- The Subsidiary Body on Scientific Technical and Technological Advice Developed 15 Guiding Principles to address biodiversity impacts from IAS:
  - precaution; 3-stage hierarchy; ecosystem approach;
  - research, education and public awareness
  - prevention: border control; info exchange; cooperation
  - Introductions: intentional; unintentional;
  - Mitigation: impacts; eradication; containment; control
- Promoted Global Invasive Species Programme (GISP) as clearing-house for disseminating technical IAS information among Parties, proposed the development of the Global Taxonomy Initiative (GTI)--V/9

# The International Plant Protection Convention

- Half of the 50,000 non-indigenous species in the U.S. are invasive weeds, and these yield the majority of the estimated \$137 billion/year economic and environmental costs to the U.S. from invasive species.
- IPPC : Intent to prevent the introduction and spread of problem plants, as well as pests of beneficial plants and native flora.



# International Plant Protection Convention

- Provisions of the Convention extend to cover conveyances, containers, storage places, soil and other objects or material capable of harboring pests.
- The IPPC has produced 19 international standards for phytosanitary measures (ISPM), which address, in part, the invasive issues.
- ISPM 11 addresses guidelines for conducting pest risk analyses, including genetically modified organisms.

# INTERNATIONAL CIVIL AVIATION ORGANIZATION

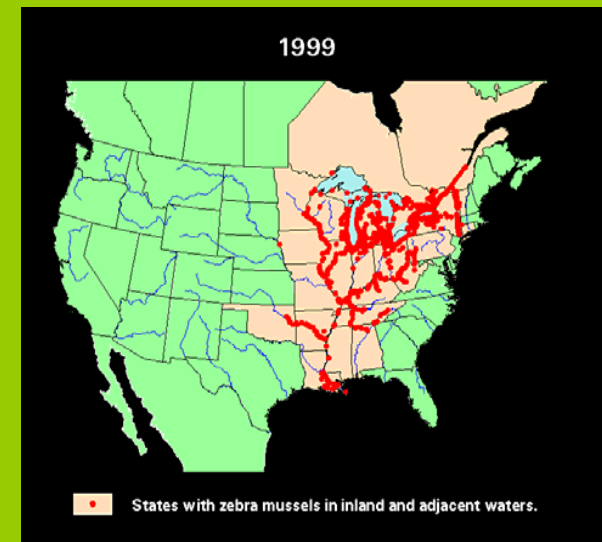
- Now addressing aviation vectors for IAS
- Recent publication of position paper
- Hitchhikers in food, packing material, wheel wells, etc.
- Need refined inspection guidelines





# International Maritime Organization (IMO)

- Roughly 10 billion tons of ballast water are discharged globally each year, causing millions of dollars of environmental harm.
- Classic ballast introductions: zebra mussel, green crab, and comb jellyfish, amongst others.
- International Convention for the Control of Ships' Ballast Water and Sediments adopted by diplomatic conference in February 2004.



# International Ballast Water Convention

- The Convention will enter into force 12 months after ratification by 30 States, representing 35 per cent of world merchant shipping tonnage
- The objective of IBWC to minimize and eliminate the transfer of aquatic IAS through ships' ballast water and sediments.
- First standards developed to replace first voluntary guidelines for ballast water exchange:  
10 orgs/ml ballast (<50  $\mu\text{m}$ ); 10 orgs/m<sup>3</sup> (>50  $\mu\text{m}$ )

# Regional and Bilateral Initiatives and Agreements

- Regional collaborative programs are tangible measures for implementing IAS control
- E.G., biological control methods



# Effective Invasive Species Prevention is Much More Than Border Control

## *Actions*

- screening for intentionally introduced species.
- Identification & addressing pathways for unintentional introduction
- Risk analysis and rapid response identification and control tools



## FTAs : Environmental Cooperation Agreements Can Be Frameworks to Promote Actions to Combat IAS

- Develop Standards for Environmental Protection & Human Health Based on Sound Science
- Implement Standards for Protection of Environmental & Human Health
- Conserve Natural Resources While Sustaining Development
- U.S. Chile, NAFTA, CAFTA

# ADDRESSING INVASIVES IN THE CENTRAL AMERICAN/DOMINICAN REPUBLIC FTA

- Tariff Reductions Increase Trade by \$772 mil in 2004, to \$1.118 in bil by 2013
- ECA is Under Development and Invasives Are Being Considered as 1 of 9 work programs under the theme of harmonizing laws, codes, standards and regulations for the protection of human health based on sound science and international norms
- Plant Threats: *Miconia calvescens*, *Eichhornia*,  
*Solanum tampicense*, *Spartina sp*
- Pet Trade Risks Ornamental fish--enter duty free  
2nd largest source of introduced fish in U.S.,  
1/3 of most devastating from aquaria



# U.S./Chile Program of Work From ECA

- 11 Action Items  
Approved by EAC
- wildlife protection
- sharing private sector expertise
- improving environmental enforcement
- Improving agricultural practices
- strengthening capacity of environmental enforcement officials
- **preventing the transmission of invasive species**



# Great Lakes Fishery Commission

- Established 1955 By Convention on G. Lakes Fisheries
- Works to prevent and manage invasive species that enter the Great Lakes through ballast water, trade of live organisms and aquaculture.
- 90% reduction in invasive sea lamprey, at \$12 million/year--good example of bilateral cooperation to address IAS.





# **Linkages Between Development Assistance and Invasive Alien Species in Southeast Asia Freshwater Systems--U.S. Aid Study**

- Three Linkages
  - Development Assistance as a Pathway of Introduction
  - Development Assistance Projects Adversely Impacted by IAS
  - Development Assistance Projects Working to Address IAS

# Assistance Projects Working to Address IAS

- Control Projects (e.g. *Mimosa pigra*)
- Education and Awareness
  - *State Dept.: Prevention & Management of IAS: Forging Cooperation in South and Southeast Asia* – August 2002
  - *International Workshop on the International Mechanisms for the Control and Responsible Use of Alien Species in Aquatic Ecosystems* – August 2003
- Assessments
  - *USAID – Linkages Between Development Assistance and Invasive Alien Species in Southeast Asia Freshwater Systems*
  - *SIDA – Exotic Species in Aquaculture: Problems & Projects*

# Development Assistance Projects Adversely Impacted By IAS

- Best Documented Case: Golden Apple Snail (GAS) (*Pomacea canaliculata*)
- Suspected or Known to Impact Development Projects
  - Irrigation and Drainage: Water hyacinth (*Eichhornia crassipes*), *Salvinia molesta*, *Mimosa pigra*
  - Food Security Projects: GAS, rats, invasive fish (tilapia, walking catfish, pacu)

# Managing Invasives in APEC Economies

- MRCWG IMP Workshops: Phase 1 (2001), Phase 2 (2004) --> Draft regional framework for controlling invasive marine pests
  - identified hull fouling as significant risk and mission for future operations in APEC
  - proposed regional fishery management organizations should address vessel contributions to IAS.
  - U.S./Chinese Sponsor APEC Strategy Meeting on IAS: September 18-22 2005

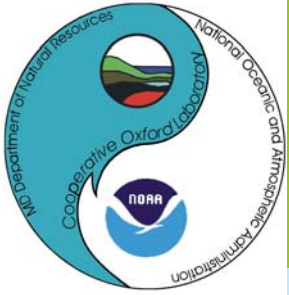
# Addressing Risks From Transboundary Movement of Aquatic Animals in the ASEAN Region of SE Asia

- NACA/FAO/OIE
- State (OES) Sponsor
- Capacity Building
- Tsunami—now what??

*Aquaculture Facilities  
Lack Containment...*

**Marteilioedes parasites  
infect the cytoplasm of  
oocytes in C. Gigas**





## Origin of *H. nelsoni* (MSX disease)

*C. gigas* importation from Japan to west coast of US since 1902 to 1980

In-situ hybridization of samples from Korea (1971), Japan (1993) and California samples gave positive reaction = *H. nelsoni*

Routine health monitoring 1989-1990 found *Haplosporidium* sp.

Movement of *C. gigas* from west coast to east coast US

MSX in East Coast US since 1957

*Minchinia* sp. in Korea in 1971

MSX in Canada in 2002

MSX confirmed in Japan in 2002

*H. nelsoni* does not cause disease in *C. gigas*; *H. nelsoni* was introduced to the US through healthy *C. gigas* which was introduced to East Coast US, where *H. nelsoni* shifted virulence to a new host, *C. virginica* and caused mass mortality.

# NGO ACTIVITIES TO COMBAT IAS

*--Critical Partners for Implementation of Policy*

*--Especially in Developing Region and SIDS*

- **shortage of scientific info on basic biology of IAS**
- **lack of awareness of problem (esp. in marine)**
- **insufficient networking mechanisms for sharing info**
- **poor coordination in SIDS for IAS management**
- **insufficient cross-sectoral policies and legislation**
- **inadequate enforcement...**

## **NGO Community IAS Involvement Con.**

- **CAB-International**
  - **Caribbean Invasive Species Strategy**
  - **Invasive Species Compendium Project (NISC/USDA)**
- **GISP (with State Funding)**
  - **Regional IAS Workshops (2001-3)**
  - **GISIN (Baltimore 2004)**
- **IUCN/ISSG:**
  - **Global Invasive Species Database,**
  - **Cooperative Initiative on Invasive Species on Islands**
- **TNC**
  - **Pacific Islands Invasives Learning Network**
  - **Clean Trade Project**
- **Pacific Islands Ecosystems at Risk Project (PIER)**
- **SEAFDEC, WWF, AUS-AID, FAO, SPREP, NACA**



# Thoughts to Part With...



- IAS impact global environmental and economic health
- National control requires international intervention
- Think inside and outside the box:
  - aquatic weeds are hosts for pathogens, not just a habitat/water quality problem;
  - can we find some positive economic use for established IAS species?
- No control and/or eradication options are without risks, & no plan is perfect,  
(but holding out for perfection can be *extremely* costly)

## Capacity Building Needs for Addressing the Problem Here and Abroad...

- Robust analyses of receiving environment for intentional introductions (quantitative!)
- More empirical research to refine risk assessments (*not reworking of the same data*)
- More local level involvement with surveillance and control
- Honest assessments of the risk of escape and intentional release
- Community education of economic and environmental risks
- Implementation of voluntary best practices by industry & trade sectors

